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The Effect of Teach for America Teachers Outside Their Classrooms

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1. Introduction

Teach for America (TFA) aims to some day make it possible for every American child to receive a great education. As means to that end TFA attempts to get teachers "willing to go above and beyond the constraints of the system to ensure that their students excel" into classrooms, to encourage "long-term, sustained leadership in education;" and to "change the prevailing ideology around educational inequity," which supports a rationalization that poor children achieve less than others because they are unmotivated and do not receive support at home (see www.teachforamerica.org). The organization argues that teachers alone cannot change the system, but that by influencing future leaders it can make the issue of educational equity a major focus for policy and funding. Corps members are at once conceived of as teachers and as backers-in-training.

TFA argues that these are complements – no learning without good teachers, no support for learning without backers, and no faith in the power of teaching without a change in ideology. While all are important, because support, faith in teaching, and good teachers already exist a program which increased only one of them could be sufficient to change education, though not necessarily enough to achieve TFA's goal. However, it is possible that by recruiting, selecting, and training teachers for all three goals the program does not achieve each of them to the best of its ability. For the purposes of this analysis, I assume that while creating backers and changing ideology almost definitely improve education in the long run, school districts that are involved with TFA need to know that the program at least does no harm to current students, and ideally improves their immediate outcomes.

While serving as teachers, TFA corps members are able to affect their own students, those outside their classes, and the overall functioning of the school because they enter with different needs, ambitions, and skills than do other teachers. Though often ignored, the second and third of these effects, which occur outside of TFA classrooms, must be included when determining the value of the program and its relative merits as compared to other strategies of recruiting teachers. In this paper I use panel data on New York City students in grades 3-8 to estimate this net impact of TFA on a school. The total TFA effect appears to be positive and significant, but to be smaller for high-need schools, even after controlling for that need. TFA teachers also appear to be markedly more effective in elementary school grades than in middle school grades.

2. The TFA Program

Teach for America targets recent college graduates of all majors and from a wide array of colleges, many but not all of them very competitive, and others with experience in leadership positions and a strong record of success, academic and otherwise. Applicants are interviewed twice and assigned scores according to a metric, developed by TFA, which emphasizes qualities it has observed in successful teachers. These include past achievement, perseverance, critical thinking skills, ability to influence and motivate others, organization, respect for others, and a devotion to the program's goals and vision. Those whose scores meet certain levels are accepted, at rates are comparable to those of an Ivy League university. Teachers commit to a two-year teaching assignment.

Most recruits have not studied pedagogy prior to entering TFA. Instead all new Corps members attend a 5-week summer institute during which they attend

classes on pedagogy and subject matter, and team-teach a summer school class with other TFAers.

TFA targets low-performing, low-income, high minority schools which have difficulty hiring enough teachers, particularly those qualified in math and science, and those willing to teach special education. In the 2007-2008 school year TFA placed approximately 5,000 teachers in 26 regions across the US and at least 3 new placement areas will be added for 2008-2009. Most sites are in inner cities, the rest in rural areas. Recruits are placed in a region based both on their preferences and qualifications. Administrators in each TFA school are able to request teachers for a number of positions from TFA, and choose from those in their area by looking through a book of resumes and other information on candidates. This occurs over the spring and summer, at which time they likely have not finished their other hiring. Again, corps members can request subjects and grades to teach, but the needs of schools are privileged in making assignments. Most TFA schools (90% in New York City) hire more than one TFA member, and some employ several of them.

Once in their schools, TFA teachers receive periodic mentoring by a regional program director. States and school districts generally require them to participate in alternative certification programs, which vary from those which carry almost no requirements to those which involve enrolling in a masters of education program. Americorps education awards are available to fund a part of coursework, and TFA has special agreements with colleges and universities in some areas with high requirements in order to lower the cost of earning a certificate or degree. The programs that are most useful for TFA teachers, and with which TFA has agreements, range from highly

respected universities (Johns Hopkins) to lower profile institutions. Corps members are paid the same as other new teachers with the same qualifications, according to district pay schedules.

Most Corps members leave their initial teaching assignment after their two-year commitment and almost all who remain do so after a third year. Kane, Rockoff and Staiger (2006) estimated that, within New York City, in a steady state 45% of all teachers who had gone through the TFA program were in their first two years, as compared to 20% of traditionally certified teachers (p5). Boyd et. al. 2007 estimated that 25% of teachers in the poorest 10% of schools were in their first or second year, so TFA teachers appear to leave at a higher rate than even their peers in similar schools. In some cases TFA teachers are replaced with new corps members, in others they are replaced by another, non-TFA, teacher. Some who continue teaching move to charter, alternative, and private schools, so their exit from the profession is overstated by many analyses, which use district payroll and personnel records that may not fully count these teachers. While these teachers are not lost to education, they are lost to the school system in which they worked, and perhaps to the neediest students. Turnover is generally assumed to be problematic because new teachers are not as good as they will be with some experience, but it is also necessary in order for TFA alumni to attain many of the "backer" positions from which the organization hopes they will contribute.

There are several impressive alumni success stories, but to my knowledge no truly representative data exists. 57% of alumni responded to a 2007 survey by TFA. Of respondents 67% remain in education, about half of whom teach (1/3 of the total). 35% of those who remain teachers ($1/9^{th}$ of the whole) move to alternative and charter schools,

leaving about 22% of alumni teaching in public schools. More than half of those who leave the education field remain involved in social justice or poverty work (Teach for America 2007). These numbers likely overstate the true involvement of alumni - those who are still involved with the program's goals probably respond at higher rates than do others. Also, because TFA attracts and selects people who are interested in social justice in general and educational change in particular, it is unsurprising that many of its alumni continue to address these issues.

The New York City Corps is currently TFA's largest, with 1000 members (out of 80,000 total teachers in the city public schools), placed in over 300 schools. Most are in the Bronx, while others work in Upper Manhattan and Brooklyn. In New York, TFA teachers must pass two written tests – one on general teaching skills and another on subject matter knowledge – and enroll in either a certificate or M.A. program to begin teaching. To continue after three years they must have received their master's degree.

New York City is unusual among TFA sites because another, fairly similar program, New York City Teaching Fellows (NYCTF) operates in the city on a larger scale. Fellows are generally older than TFA teachers, with only 30% coming directly from college, and are selected to be career teachers rather than short-term teachers and long-term backers. They tend to have done well in school and in the careers they have pursued. Fellows undergo pre-service training like that used by TFA, and enroll in a subsidized masters program while teaching. About 8,000, or 10% of teachers in the New York Public Schools in the current school year, became a teacher through the fellows program, even though it was only founded in 2000. Recently other programs following the NYCTF model have begun, though generally not on the same scale. These are both

alternatives to TFA for districts and schools in need of qualified teachers and an extension of its model of selective, high-profile alternative certification.

3. Literature

Whether TFA is able to produce effective teachers has been the subject of debate since the program began in 1990, and gained greater urgency in the late 1990s when alternative certification programs began to proliferate. In recent years, as the program has expanded, it has become possible to empirically test the effect of TFA teachers. Raymond, Fletcher, and Luque (2001) and Darling-Hammond, et. al. (2005) addressed the impact of TFA teachers on student academic achievement in Houston. Both found that TFA teachers were generally the same or worse than teachers who had gone through traditional certification programs, and better than those in other alternative programs, as measured by their students' performance on standardized tests.

Kane, Rockoff, and Staiger (2006) studied New York City students in grades 4-7 in order to determine if the certification status of their teacher (TFA, New York Teaching Fellows, international, and traditionally certified teachers) impacted their achievement on standardized tests. Their results suggested that Teach for America teachers perform slightly (but statistically significantly) better than the average teacher in teaching math and essentially the same at teaching reading. Boyd, et.al. (2005) conducted a similar study comparing teachers who had entered teaching through different pathways, also using New York City data. They found that teachers who entered through alternative certification routes were at first worse at teaching both reading and math than those who had gone through a traditional teacher education program, but that the differences disappeared after 2-5 years of teaching, at which point most TFA teachers leave.

Glazerman, Mayer, and Decker (2006) received agreements from principals to assign students randomly to classes in a sample of grades-within-schools which contained both TFA and non-TFA teachers. TFA teachers were compared with all other teachers in the same grade within a school to determine the differences between them. Their results were similar to those of Kane, Rockoff and Staiger – TFA teachers were better than other teachers at teaching math and the same at teaching reading. Glazerman, et. al. also examined TFA teachers' impact on other student outcomes – retention in grade, assignment to summer school, disciplinary incidents, chronic absence, tardiness, and the extent to which students disrupted classes – but found them to be the same as their counterparts in all but the last category. Assessments of disruptive behavior came only from a teacher survey, and as other things which might be associated with it, particularly disciplinary incidents, were not different in TFA classrooms, the authors speculated that the true difference may be that TFA teachers expect students to be less disruptive, based on their own experience as students.

4. The TFA Effect

These studies, and all others which I am aware of, only address the effects of TFA teachers on the students in their classrooms. TFA teachers should have different impacts beyond their classrooms as well, because they enter with different skills, motivations, and needs, and because their turnover structure is different than that of other teachers.

4.1 Quality

TFA teachers enter with less training than those who go through traditional education programs, so they might be expected to need more guidance at first than other teachers. Boyd, et.al's conclusion that alternatively certified teachers were markedly

worse than their traditionally certified peers during their first 2-5 years, but then performed at the same level, would suggest that this is true, at least at a classroom level. In many schools in which TFA teachers teach, however, most new teachers do not come through traditional certification, instead recruited through other alternative or emergency certification programs. Where entrance requirements are low these teachers may begin teaching with little or no training. Thus TFA teachers are at least sometimes no less trained –and possibly more trained – than are their peers.

TFA teachers are also rigorously selected for a number of characteristics which might predict their being more involved in after school activities and more able to seek out the resources they need, be they mentoring, materials, or support from students' families. Within the program teachers are trained and encouraged to engage in these and other behaviors which TFA believes will make them more effective. Though many well-respected traditional and alternative certification programs are able to be very selective in the candidates they accept, they look for different things in candidates, and likely emphasize leadership experience and the ability to seek out resources less than TFA does. TFA also runs its own mentoring program. Other programs and school districts also offer mentoring, but TFA's serves as a further method for the program to shape teachers according to its ideal. It may be either be better or (less likely) worse than those offered to other new teachers in the same school or district.

4.2 Turnover

TFA teachers are more likely to stay during the first 2 years, and more likely to leave after year 2 or year 3 than are others (Boyd et. al. 2005). As noted earlier, their overall turnover is higher than that for teachers in general in low income schools. Some

turnover is a good thing, as some corps members discover that they are not skilled at teaching, despite the rigorous selection process TFA uses. That experienced by TFA teachers is likely far beyond this level.

While many other teachers move from low- to middle- or high-income schools after a few years, TFA teachers tend to leave education in general if they stop teaching in low-income, high-need areas. Thus when they leave their teaching-specific skills are lost, rather than being transferred to a different group of students. Hanushek, Kain and Rivkin (2005) found empirical gains in student test scores to be significant over the first 2 years, but not after. The conclusion by Boyd et.al. that alternatively certified teachers were even worse than other starting teachers but caught up after a few years is particularly troubling, as most TFA teachers have left their initial schools by then.

Turnover forces schools and teachers to build social capital– the relationships, understandings and systems which allow people to work together effectively – more often. Even in schools with high levels of turnover, some amount of social capital is necessary simply for the school to function. Faster rates of turnover should mean that more time, in total, is invested in the cultivation of social capital, and that the school is less effective, on average, as it is more common for it to be in the early building stages, when this capital most likely does not function particularly well.

Because there are indications that teachers are noticeably worse than they would otherwise be during their first 2 years in particular, perhaps carrying on to the fifth year, having many teachers who stay for only 2 -3 years may be worse than having some who leave after 1 and some who stay beyond the third year, even if their average turnover

were the same. If this is the case, TFA schools might be putting significant resources into training teachers, only to have them leave teaching when fully trained.

Some have claimed that high turnover makes TFA unable to truly affect education, as it means its teachers are relatively inexperienced and unprepared. TFA has also been criticized as a well-meaning but mistaken movement in which a few young people, at least on average whiter and higher income than the population they are serving, expect to come in and "fix" systemic problems without understanding their underlying causes (Darling-Hammond, 1994). Others have argued that TFA teachers are better then other starting teachers by a large enough margin to compensate for their high turnover rate. Kane, Rockoff and Staiger, 2006, estimated that TFA teachers would have to create a .02 standard deviations difference to compensate for their high exit rate, approximately what they found. This only accounts for the in-classroom effects of turnover, so a full accounting of the loss to the school would be somewhat higher, but so would a full estimate of their benefits.

Rather than attempting to slow the turnover of its teachers by recruiting those who are interested in education as a career, TFA focuses on those who are willing to make the two-year commitment and it predicts will be successful as teachers. Corps members are not required to attain any more education-specific credentials than are mandated by local certification requirements, and are not specifically encouraged to stay in teaching for the long term. TFA does, however, have partnerships with corporations and fellowships, encouraging college graduates to defer their offers for two years in order to teach, and with programs which offer training in education administration. This is not surprising –

for TFA's goals, as it understands them, to be reached, many or most of its alumni must leave teaching for other positions in administration, politics, and elsewhere.

5. Data

In order to test the presence and size of these quality and turnover effects, I use school-level panel data on scores from the New York City Department of Education (NYCDOE) and yearly Report Cards, produced by New York State, which list school characteristics. Students in grades 3-8 are given yearly tests in English language arts and math in New York City. The score data is available for the years 1998-1999 to 2006-2007, while characteristic data is currently only available for the years 2003-2004 to 2005-2006. TFA has identified the schools in which it placed teachers, and the number placed there, for the years 1999-2005, which gives me a full count of TFA for the 2000-2001 to 2005-2006 years. Because of limitations imposed by the construction of this data, I only fully use the years 2003-4 and 2004-5, the English Language Arts test, and districts 1-10 and 12 (out of 31 in the city.) Data on student scores and TFA placement in prior years is included in my data. The districts chosen include almost all of the TFA teachers placed in New York City during the 1999-2005 period and more than 300,000 students in 2003-2004.

Table 1.

Variable Means and Standard Deviations

	Mean	Std. Deviation
Percent TFA	2.190	5.046
Percent Free Lunch	73.856	24.933
Percent Latino	56.430	23.158
Percent Black	28.942	18.619
Percent LEP	16.350	14.292

Score	645.495	28.651
Change in Score	4.897	10.752

Using student test scores to measure teaching skill or the impact of schooling is imperfect. Many important things which students learn are not well measured by tests, and some of them may detract from the kind of learning which is tested. However, they provide a proxy for learning, and are far easier to work with than even the most tangible of qualitative measures. I believe that they are a particularly strong proxy in the elementary grades when the tests focus mostly on basic skills, for low-performing students, for whom the additional material learned is, again, a basic skill, and in reading and math, where curriculums cover the same material, if sometimes in different ways. While they are imperfect, they are also better than useless.

It may be that some kinds of teachers are more dedicated to testing, or that some see it as an end and other as a means. If, for instance, TFA teachers were less concerned with testing than others because they did not seek to move up the standard career ladder for teachers, we could expect their students to achieve lower on tests, in comparison to other students, than their actual achievement should predict. Given TFA's support for standardized testing, and their insistence that teachers make 1.5 grade levels of improvement with students in each year, it is unlikely that they are systematically less concerned with testing results (McClaugherty Cosner 2007). If school-level emphasis on tests is correlated with some independent variables, or differs noticeably between TFA and non-TFA schools I am unable to test for it, and it will appear as differences in student outcomes.

6. Model and Results

Educational production functions relate some vector of student characteristics and some vector or vectors of characteristics associated with school, teacher, district, etc. to student outcomes, usually measured by test scores. Because of the data available to me I use school average scores and characteristics.

6.1 Controlling for prior year score

A value added model, using gains in scores rather than absolute scores as the dependent variable, describes the effect of all inputs in the year studied, rather than all cumulative past effects. The previous year's score represents the accumulation of past teaching, family, and peer effects, as well as individual intellect, and may predict the student's environment in the year studied. It is also possible that teaching certain levels of skills is easier for particular teachers or teachers in general. For these reasons I include the previous year's score as an independent variable within the value-added specification.

The NYCDOE uses the percent of students receiving free lunch and classified as Limited English Proficiency to place schools in categories according to need. They are also often strong predictors of student scores. Race is intended to proxy for cultural and other dynamics which may cause families and students to value and think about learning differently, and is traditionally included.

(1) $$Y_{ijt} = \alpha_1 + \alpha_2 S_{ijt-1} + \alpha_3 B_{jt} + \alpha_4 L_{jt} + \alpha_5 LEP_{jt} + \alpha_6 Free_{jt} + \alpha_7 TFA_{jt} + \varepsilon_{ijt}$$

Y_{ijt} is the change in the average score for grade i at school j, in year t from year t-1. S_{ijt-1} is the grade's average score in the past year, B_{jt} and L_{jt} the percent of Black and Latino students, respectively, LEP_{jt} is the percent of students classified as Limited English

Proficiency, and $Free_{jt}$ is the school percent eligible for free lunch. TFA_{jt} is the percentage of the school's teachers who are in the TFA program.

In order for this model to be valid, I assume that unobserved education inputs are not correlated with the decision to request TFA, or to place them in a particular school when the analysis is restricted to those schools in the TFA labor market. It does seem possible, however, that the schools which decide to work with TFA have either higher (more dedication to learning) or lower (more difficulty attracting qualified teachers) levels of teaching quality than do their peers.

In order to test this assumption I regress the percent of TFA teachers in a given school against the school characteristics and average score from the previous year. If the coefficient on the average score were significant it would suggest that determinants of student test scores which were not effectively proxied for by the observed characteristics were involved in the assignment of TFA to schools. As a result, I would be unable to identify the direction of causality of any link between TFA and test scores. Results appear in Table 2. The coefficient on prior year score is not significant ($t = .033$), but the adjusted R-squared for the equation is very low (.014.) Some other unobserved, perhaps random, component or components must be responsible for most of the variation in the percent of TFA in a school. As it is not correlated with student scores this will at least not bias the results.

The value-added model suggests that introducing TFA teachers provides a small but significant increase in student scores over time. The percent receiving free lunch and prior year score carry significant coefficients in the expected direction. Percents non-white and Limited English Proficient are not significant.

However, the data suffers from heteroskedasticity – larger schools have less volatile average scores than do small schools and individual grades within schools. The residuals are also auto-correlated (Durbin-Watson of 2.912,) suggesting that scores fluctuate more or less randomly around a mean for a given school, so that a year with a high score will be followed by one with negative or fairly small change. In order to obtain unbiased estimates of the standard errors of the coefficients I use the Newey-West heteroskedasticity and serial correlation consistent variance estimator. Results appear in Table 4. The percent of TFA teachers and of students receiving free lunch are significant at the 1% level, the former positive and the latter negative. Prior year score is also significant, and positive, at the 1% level. The percent of students who are Black, Latino, or limited English proficient are insignificant.

The adjusted R-squared of this regression is very small, suggesting that omitted variables and random fluctuation are responsible for the great majority of score change. If omitted variables are correlated with the regressors used OLS estimates of the coefficients will be biased. In order to test for this correlation I regress the residuals of equation (1) on the independent variables. All coefficients are extremely insignificant, and the adjusted r-squared is also very small. Results appear in Table 3.

6.2 Controlling for prior year change

While controlling for prior year score takes all past inputs into account, it may include experiences whose effects ended sometime in the past. These may continue to affect a student's level of knowledge and skills without also affecting their accumulation. If a student experiences a random shock to their education in one year, i.e. missing a period of school, they might achieve less that year, but, as long as the disruption did not

recur, would achieve their normal amount in subsequent years. Controlling for prior year progress instead shows the change in the schools' ability to produce learning.

(2) $Y_{ijt} = \alpha_1 + \alpha_2 Y_{ijt-1} + \alpha_3 B_{jt} + \alpha_4 L_{jt} + \alpha_5 LEP_{jt} + \alpha_6 Free_{jt} + \alpha_7 TFA_{jt} + \varepsilon_{ijt}$

This specification appears to better explain change in scores – the adjusted R-squared is .137 – though unobserved variables still play a very large part. Interestingly, the coefficient on previous year change is negative. The effect of the percent of TFA in a school appears to be significant, positive, and slightly larger than that in equation (1), though still small. The coefficient on the percent of students receiving free lunch is also significant and negative. Those on the percents Black, Latino, and Limited English Proficient are insignificant.

The data continues to suffer from heteroskedasticity and serially autocorrelated residuals. After correcting for this, again by using Newey-West heteroskedasticity and serial correlation consistent variance estimates, the effect of TFA teachers is significant and positive, and the effects of the percent of students who are Latino or receive free lunch significant and negative. Interestingly, the coefficient on prior year change is negative, significant, and far larger in magnitude than are any others. This might suggest that change becomes increasingly difficult as more progress is made, or, perhaps more likely, that many schools experience one-off increases in scores, leading to negative change in the next year. Results appear in Table 4.

Again, the adjusted R-squared is very small, so omitted variables are a concern. Random changes are likely the cause of much of the variation, but many variables which may affect education outcomes are not included. Testing reveals that any omitted

variables are uncorrelated with the independent variables, so they at least do not bias the results. Test results appear in Table 3.

6.3 Elementary vs. Middle School Grades

TFA teachers tend to be overrepresented in elementary schools, both in New York City and in general, so restricting my analysis to elementary grades may better highlight the impact TFA teachers have on schools. More importantly, education occurs very differently in early grades than it does later. A single teacher has the opportunity to affect more students in a given year at a middle school, but also plays a smaller part in determining a given student's progress. To a certain extent the skills and knowledge which are taught in early grades are different from those addressed later, the former emphasizing behavior and learning techniques, the latter more factual knowledge. Teachers in elementary schools are forced to understand and communicate all subjects, while those in middle schools are expected to have more depth and less breadth in their knowledge and teaching abilities. The students too are different, both developmentally and in their experiences, requiring different strategies and character traits to teach well.

Comparing elementary and middle schools is complicated by the fact that some schools change to a standard middle and high school paradigm – separate classes for separate subjects, some amount of student choice, and increased leveling or tracking – in 6^{th} grade, while others do not do so until the 7^{th} grade. In other schools there may be a transition over the course of several years. In order to account for this I use equation (1) with a break at both the 6^{th} and 7^{th} grades, correcting for heteroskedasticity and serially autocorrelated residuals with Newey-West estimates. The results are quantitatively

different, but qualitatively similar, so I will discuss only the results with the break at the 7th grade. Regression results for both appear in Table 5.

The regression for middle schools accounts for almost ten times as much of the variation in scores as does that for elementary schools (adjusted R-squared of .198 versus .025.) The coefficient for prior year score is negative for both groups, perhaps suggesting that change is smaller when students start at a higher level. The effects of all background variables are markedly larger for the middle school group, with the exception of the percent of students receiving free lunch, which is approximately the same. The percents of Latino and LEP students are not significant for elementary schools, but are at the .01 and .05 levels, respectively, for middle schools. Students classified LEP in middle school were likely not in the district, or perhaps even in the country, when they went through elementary schools, so their lower scores may be associated with missing the early years of the US or New York City education system as much as with not speaking English fluently. This suggests that a student's background and academic history are far more deterministic in later years, and that this carries over to the school level.

The effect of TFA is positive for both groups, but only significant for elementary school students (using the 6th grade as a break point makes the TFA effect in middle schools significant, though still much smaller than that in elementary schools.) This is somewhat surprising, as subject matter knowledge, which TFA teachers tend to have a lot of, is generally understood to be more important in later grades, while teacher training, which TFA teachers have relatively little of, is expected to be more important in earlier grades. It might be that the energy and idealism which TFA teachers tend to have is more important to teaching younger students, or even that younger students are more receptive

to them. In any case, it suggests that TFA's decision to place its teachers largely in elementary schools is an efficient one.

6.4 Functions Allowing for Interaction

The level of one education input likely affects the effectiveness of others. For example, teacher skill might have a larger effect when the students are further behind or are learning in a language in which they are not fluent. Studies which have allowed for some sort of interaction between inputs have found inputs to be statistically significant more often than those which have not, suggesting that imposing a simple linear structure on the educational production function excludes considerable information (Figlio, 99). In order to allow for interaction I estimate a logarithmic function:

(3) $Ln(Y_{ijt}) = \alpha_1 + \alpha_2 \ln(S_{ijt-1}) + \alpha_3 \ln(B_{jt}) + \alpha_4 \ln(L_{jt}) + \alpha_5 \ln(LEP_{jt}) + \alpha_6 \ln(FREE_{jt}) + \alpha_7 \ln(TFA_{jt}) + \varepsilon_{ijt}$

After correcting for heteroskedasticity and serially autocorrelated residuals the effect of TFA is positive and significant. Aside from this, only free lunch appears to be significant, in the expected direction, and of larger magnitude. Results appear in Table 4.

While the logarithmic function allows the level of one input to affect the effectiveness of another, it does little to illuminate how this occurs. For this task a model with interaction terms is necessary. I interact the percentage of TFA teachers in a school with all background variables and the prior year score.

(4) $Y_{ijt} = \alpha_1 + \alpha_2 S_{ijt-1} + \alpha_3 B_{jt} + \alpha_4 L_{jt} + \alpha_5 LEP_{jt} + \alpha_6 Free_{jt} + \alpha_7 TFA_{jt} + \alpha_8 S_{ijt-1} * TFA_{jt} + \alpha_9 B_{jt} * TFA_{jt} + \alpha_{10} L_{jt} * TFA_{jt} + \alpha_{11} LEP_{jt} * TFA_{jt} + \alpha_{12} Free_{jt} * TFA_{jt} + \varepsilon_{ijt}$

Results appear in Table 6. TFA appears to be less effective in schools with higher percentages of students with free lunch, higher percentages of Latino students, and lower prior year scores. The coefficients on all these variables when not interacted with the percent of teachers who are TFA are all insignificant with the exception of prior year score. This suggests that schools with TFA teachers have a harder time than others at helping high-minority, low-income, and limited-English students succeed than they would a student population with lower need, and that this gap is larger than that faced with non-TFA schools, and implicitly non-TFA teachers. It may be that the skills TFA teachers tend to lack, specifically pedagogical training, are more important in teaching high-need students, or that the schools in which TFA teachers teach are less able to address the needs of these students. The difference in the backgrounds of students and teachers may also matter – TFA teachers have a higher probability of being white and relatively affluent than do either the students they teach or the other teachers in that school.

In a hypothetical extremely high-need school with 1% TFA, 100% free lunch eligibility, 30% of students classified as Limited English Proficient, and a scale score of 600, the net effect of TFA would still be positive, though insignificant. TFA's decision to focus on high-need schools does not appear to harm them. It does mean that TFA teachers may be powerless to change education for the highest-need students by their work in the classroom.

Placing TFA teachers in the more difficult schools may, however, be an efficient, or at least effective, way of producing motivated backers and national attention. To the extent that these focus resources and energy on the education gap TFA's placement

policy may be a good choice for producing overall change, which, rather than immediate student achievement, is the organization's end goal.

7. Conclusion

Teach for America depends on the teachers it recruits and trains to act as the foot soldiers for educational change. While several studies have evaluated their impact on the students they teach, none before has sought to find the school-level effect of TFA teachers, which should be the most pertinent to decisions by school administrators on whether or not to hire TFA teachers. It appears that TFA teachers do have a distinct positive effect on the schools they teach in. Unfortunately, this level of data does not allow me to decompose the TFA effect into turnover and quality effects, or to probe the potential of TFA teachers to affect the labor market. That this effect differs markedly between elementary and middle school-level classes is somewhat surprising, but it also suggests that TFA has been placing its teachers in the correct level of classes, though perhaps unknowingly.

Perhaps most interesting is the finding that TFA teachers would be most effective with students they are unlikely to encounter, and which the program does not focus on. It may be that special teaching skills are more necessary for students with fewer advantages and less history of performance, or that TFA teachers struggle to connect to students who tend to come from a different background than theirs. The solution to this problem depends on which of these is its source, which could be probed with richer data on teacher characteristics. In any case, it would be a useful one for TFA, and other alternative certification programs, to know and implement.

Table 2. TFA placement (Section 6.1)

Dependent Variable	Percent TFA	
Specification	TFA Placement Bias	
	Coefficient	Std. Error
Constant	**1.597	0.223
Prior Percent Free Lunch	0.002639	0.00818
Prior Percent Latino	0.0119	0.007625
Prior Percent Black	0.00774	0.00822
Prior Percent LEP	0.000408	0.00813
Prior Score	1.13E-05	0.000398

All standard error and significance estimates in this and following tables made using the Newey-West heteroskeasticity and serial autocorrelation consistent variance estimator.
* Significant at .1 level
** Significant at .05 level
*** Significant at .01 level

Table 3. Tests of Correlated Residuals and Independent Variables (Section 6.1 and 6.2)

Dependent Variable	Residuals			
Specification	Prior Year Score		Prior Year Change	
	Coefficient	Std. Error	Coefficient	Std. Error
Constant	-3.74E-15	0.596	1.48E-14	0.789
Percent TFA	-6.84E-18	0.0334	8.13E-17	0.047
Percent Free Lunch	-2.21E-16	0.00876	2.26E-16	0.0101
Percent Latino	2.00E-16	0.0104	-5.73E-16	0.0126
Percent Black	1.71E-16	0.0112	-2.09E-16	0.0136
Percent LEP	1.03E-16	0.0283	3.64E-16	0.017
Prior Year Score	4.21E-18	0.00032		
Prior Year Change			-9.06E-17	0.0243

Table 4. Value Added Models and Logarithmic Model (Sections 6.1, 6.2, 6.4)

Dependant Variable	Change in Score					Log Change in Score	
Specification	Prior Year Score		Prior Year Change				
	Coefficient	Std. Error	Coefficient	Std. Error		Coefficient	Std.Error
Constant	***2.297	0.596	***6.722	0.808	Constant	***-57.292	9.558
Percent TFA	***0.111	0.0333	***0.134	0.0431	Log(Percent TFA)	**0.115	0.0495
Percent Free Lunch	***-0.031	0.00876	**-0.0209	0.00949	Log(Percent Free Lunch)	***-0.346	0.0957
Percent Latino	0.0107	0.0103	0.012	0.0123	Log(Percent Latino)	-0.237	0.207
Percent Black	-0.0168	0.0112	*-0.0249	0.0133	Log(Percent Black)	0.0458	0.0756
Percent LEP	-0.00885	0.0283	-0.0302	0.0253	Log(Percent LEP)	0.141	0.11
Prior Year Score	***0.00715	0.00032			Log(Prior Year Score)	***9.420	1.464
Prior Year Change			***-0.440	0.0359			

Table 5. Elementary and Middle School Grades

Dependant Variable	Change in Score							
Specification	Grades 3-5		Grades 6-8		Grades 3-6		Grades 7-8	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
Constant	***72.242	10.16	***195.585	20.879	***45.839	10.039	***218.195	32.577
Percent TFA	**0.173	0.0813	**0.0846	0.039634	***0.216	0.052	0.0761	0.0572
Percent Free Lunch	***-0.0564	0.0134	***0.0618	0.0174	***-0.0569	0.0122	**-0.0489	0.0223
Percent Latino	*-0.0286	0.0164	***-0.123	0.0295	-0.00566	0.0145	***-0.130	0.337
Percent Black	***-0.0815	0.0193	***-0.199	0.0311	**-.0549	0.0178	***-0.209	0.0378
Percent LEP	-0.0307	0.0373	*-0.0734	0.0381	-0.0347	0.0348	**-0.124	0.0484
Prior Year Score	***-0.0933	0.0147	***-0.258	0.0285	***-0.0535	0.0144	***-0.291	0.0443

Table 6. Interaction Term Model (Section 6.4)

Dependent Variable	Change in Score	
Specification	Interaction Terms	
	Coefficient	Std. Error
Constant	***2.232	0.598
Percent TFA	0.7555	0.666
Percent Free Lunch	***-0.0304	0.00966
Percent Free Lunch * Percent TFA	*-0.00538	0.00321
Percent Latino	0.00361	0.00981
Percent Latino * Percent TFA	-8.54E-05	0.00809
Percent Black	-0.01429	0.0118
Percent Black * Percent TFA	-0.00273	0.00731
Percent LEP	0.0235	0.0241
Percent LEP * Percent TFA	**-0.00949	0.00434
Prior Year Score	***.00685	0.000368
Prior Year Score * Percent TFA	**0.000157	7.54E-05

Bibliography

Boyd, Donald, Lankford, Hamilton, Loeb, Susanna, and Wyckoff, James, 2005a "The Draw of Home: How Teachers' Preferences for Proximity disadvantage Urban Schools" *Journal of Public Policy Analysis and Management*, Vol. 24 No. 1 pp113-137.

Boyd, Donald, Grossman, Pamela, Lankford, Hamilton, Loeb, Susanna, and Wyckoff, James 2005b. "How Changes in Entry Requirements Alter the Teacher Workforce and Affect Student Achievement" Working Paper 11844, National Bureau of Economic Research.

Darling-Hammond, Linda, 1994. "Who Will Speak for the Children? How 'TFA' Hurts Urban Schools and Students," *Phi Delta Kappan*, Vol. 76 No. 1, 21-34.

Darling-Hammond, Linda, Holtzman, Deborah, Gatlin, Su Jin, Heilig, Julian Vasquez 2005. "Does Teacher Preparation Matter? Evidence about Teacher Certification, Teach for America, and Teacher Effectiveness" *Education Policy Analysis Archives*, vol. 13, no. 42.

Figlio, David, 1999. "Functional Form and the Estimated Effects of School Resources" *Economics of Education Review*, 18, pp 241-252.

Glazerman, Steven, Mayer, Daniel and Decker, Paul 2006. "Alternative Routes to Teaching: The Impacts of Teach For America on Student Achievement and Other Outcomes" *Journal of Public Policy Analysis and Management,* Vol. 25 No. 1 pp 75-96.

Goldhaber, Daniel, 2007. "Everyone's Doing it, But What Does Teacher Testing Tell Us About Teacher Effectiveness?" *Journal of Human Resources*, Vol. 42 No. 4, 765-94.

Goldhaber, Daniel and Brewer, Dominic, 1997. "Why Don't Schools and Teachers Seem to Matter? Assessing the Impact of Unobservables on Educational Productivity," *Journal of Human Resources*, Vol. 32, No. 3, pp. 505-523.

Hanushek, Eric, 1986. "The Economics of Schooling: Production and Efficiency in Public Schools" *Journal of Economic Literature*, Vol. 24, September 1986, pp. 1141-1177.

Hanushek, Kain and Rivkin, 2005. "The Market for Teacher Quality" Working Paper 11154, National Bureau of Economic Research.

Kopp, Wendy, 1994. *Phi Delta Kappan* Vol. 76 No. 3, 262.

Kopp, Wendy, 2003. *One Day All Children*, New York: Public Affairs.

Kane, Thomas, Rockoff, Jonah, and Staiger, Donald, 2006. "What does Certification Tell us About Teacher Effectiveness? Evidence from New York City" Working Paper 12155, National Bureau of Economic Research.

McClaugherty Cosner, Helen, 2007. Interview, 27 November 2007.

Murray, Michael, 2006. *Econometrics A Modern Introduction*, New York: Pearson Addison Wesley.

Raymond, Margaret, Fletcher, Stephen, and Luque, Javier 2001. *Teach for America: An Evaluation of Teacher Differences and Student Outcomes in Houston, Texas,* Stanford, CA: CREDO, Stanford University.

Summers, Anita and Barbara Wolfe, 1977. "Do Schools Make a Difference?" *American Economic Review*, Vol. 67 No. 4, pp 639-652.

Teach for America, 2007. *Alumni Social Impact Report.* http://teachforamerica.org/mission/our_impact/documents/ASIR.FINAL.Color_001.pdf, accessed 3 Dec 07.

Todd, Petra and Kenneth Wolpin, 2004. "The Production of Cognitive Achievement in Children: Home, School and Racial Test Score Gaps," PIER Working Paper 04-019.